What is claimed is:

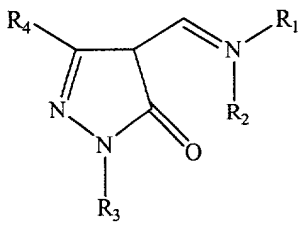
1. A method for identifying compounds that inhibit uracil biosynthesis comprising the following steps:
   i) applying test compounds to plant tissue in the presence of pyrimidine biosynthetic pathway intermediates or end-products;
   ii) applying test compounds to plant tissue in the absence of pyrimidine biosynthetic pathway intermediates or end-products;
   iii) comparing the effects of the test compound from step i) with the effects of the test compounds from step ii); and
   iv) noting the test compounds in step iii) that show reversed effects in the presence of said intermediates or end-products.

2. The method according to claim 1, wherein the intermediates or end-products are selected from the group consisting of: uracil, uridine-5'-monophosphate, uridine, orotate, OMP, aspartate, carbamoyl phosphate, N-carbamoyloaspartate, L-dihydroorotate, NAD+, PRPP, UDP, UTP, cytidine, and thymidine.

3. The method according to claim, 1 further comprising the step of determining which test compounds have herbicidal effects.

4. The method according to claim 1, further comprising the step of determining which test compounds have fungicidal, insecticidal or nematicide effects.

5. An herbicidally active compound having the formula I:



(I)

wherein:

R_1 is hydrogen or C_1-C_6-alkyl unsubstituted or substitued with one to three of the following radicals: cyano, nitro, hydroxyl, mercapto, amino, carboxyl, C_1-C_4-alkoxy, C_1-C4-haloalkoxy, C_1-C_4-alkoxycarbonyl or C_1-C_6-alkylthio;

R_2 is hydroxy, OR_5, aryl, arylmethylene, hetaryl, hetarylmethylene unsubstituted or substitued with one to three of the following groups: halogen, cyano, nitro, hydroxyl, mercapto, amino, carboxyl, aminocarbonyl, aminothiocarbonyl, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, and C_1-C_6-alkoxycarbonyl;

R_3 is C_1-C_4-alkyl or hydrogen;

R_4 is hydrogen or hydroxy; and

R_5 is C_1-C_6-alkylcarbonyl or a formyl-moiety bonded to the structure via the carbon atom;

with the proviso that if R_1 is H, R_2 can also be HNR_6, wherein R_6 is aryl, arylmethylene, hetaryl, hetarylmethylene unsubstituted or substituted with halogen, cyano, nitro, hydroxyl, mercapto, amino, carboxyl, aminocarbonyl, aminothiocarbonyl, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, or C_1-C_6-alkoxycarbonyl;

or an agriculturally acceptable salt or ester thereof.

6. The herbicidal compound of claim 5, wherein the compound is:
4-[[(2,4-dichlorophenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;
4-[[(2,4-difluorophenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;
2-[[(5-oxo-1,5-dihydro-4H-pyrazol-4-ylidene)methyl]amino]benzonitrile;
2,3-dihydro-3-oxo-1H-pyrazole-4-carboxaldehyde-4-oxime;
4-[(dimethylamino)methylene]-2,4-dihydro-3H-pyrazol-3-one;
Hydrochloride of 4-[(dimethylamino)methylene]-2,4-dihydro-3H-pyrazol-3-one;
4-[[(2,4-difluorophenyl)amino]methylene]-2,4-dihydro-2-methyl-3H-pyrazol-3-one,;
Hydrochloride of 4-[(dimethylamino)methylene]-2,4-dihydro-2-methyl-3H-pyrazol-

3-one;

2-aminobenzonitrile, 4,5-dihydro-5-oxo-1H-pyrazole-4-carboxylic acid;

4-[[[2-(trifluoromethyl)phenyl]amino],methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[[3-(trifluoromethyl)phenyl]amino],methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(4-methoxyphenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(3-chlorophenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(1,5-dihydro-5-oxo-4H-pyrazol-4-ylidene)methyl]amino]benzoic acid, methyl ester;

4-[[(2-methoxyphenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(3-methoxyphenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(4-nitrophenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(3,5-dichlorophenyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(1,5-dihydro-5-oxo-4H-pyrazol-4-ylidene)methyl]amino]-N,N-dimethylbenzenesulfonamide;

4-[[[4-(trifluoromethoxy)phenyl]amino], methylene]-2,4-dihydro-3H-pyrazol-3-one;

3-[[(1,5-dihydro-5-oxo-4H-pyrazol-4-ylidene)methyl]amino]-2-thiophenecarboxylic acid, methyl ester;

4-[[(3-pyridylmethyl)amino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

4-[[(2,4-difluorophenyl)methylamino]methylene]-2,4-dihydro-3H-pyrazol-3-one;

5-hydroxy-1H-pyrazole-4-carboxaldehyde, 2,4-difluorophenylhydrazone; or

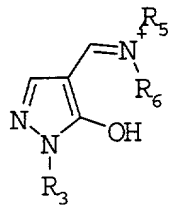
4-[[(2,4-difluorophenyl)amino]methylene]-3,5-pyrazolidinedione.

7. An herbicidal composition comprising the herbicidal compound of claim 5 and a carrier.

8. A method of herbicidally treating an undesired plant comprising contacting the undesired plant or area intended for crop plants with an herbicidally effective amount of the compound of claim 5.

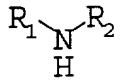
9. A method of herbicidally treating an undesired plant comprising contacting the undesired plant or area intended for crop plants with an herbicidally effective amount of the compound of composition of claim 7.

10. A process for preparing the compound of claim 5, wherein R_4 is hydrogen, comprising reacting an amoniumsalt of the formula II



II

wherein R_3 is hydrogen or C_1-C_4-alkyl, and R_5 and R_6 are both independently hydrogen or C_1-C_4-alkyl or both together for C_3-C_5 alkylene; with an amine of formula III



III

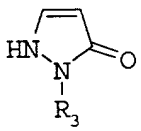
wherein

R_1 is hydrogen or C_1-C_6-alkyl unsubstituted or substitued with one to three of the following radicals: cyano, nitro, hydroxyl, mercapto, amino, carboxyl, C_1-C_4-alkoxy, C_1-C4-haloalkoxy, C_1-C_4-alkoxycarbonyl or C_1-C_6-alkylthio; and

R_2 is hydroxy, OR_5, aryl, arylmethylene, hetaryl, hetarylmethylene unsubstituted or substitued with one to three of the following groups: halogen, cyano, nitro, hydroxyl, mercapto, amino, carboxyl, aminocarbonyl, aminothiocarbonyl, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, and C_1-C_6-alkoxycarbonyl;

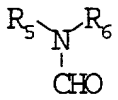
to produce the compound of claim 5.

11. A process for preparing the compound of the formula II of claim 10 comprising reacting a pyrazolone of the formula IV



IV

wherein R_3 is hydrogen or C_1-C_4-alkyl in Vilsmeyer reaction with a dialkylformamide of formula V



V

wherein R_5 and R_6 are both independently hydrogen or C_1-C_4-alkyl or both together for C_3-C_5 alkylene; to produce the compound of formula II.

12. A compound of the formula II as defined in claim 10, or an agriculturally salt or ester thereof.

13. A process for production of pesticidal agents comprising the following steps:
    a) identification of the uracil biosynthesis inhibitor comprising
    i) applying test compounds to plant tissue in the presence of pyrimidine biosynthetic pathway intermediates or end-products;
    ii) applying test compounds to plant tissue in the absence of pyrimidine biosynthetic pathway intermediates or end-products;
    iii) comparing the effects of the test compound from step i) with the effects of the test compounds from step ii); and
    iv) noting the test compounds in step iii) that show reversed effects in the presence of said intermediates or end-products; and
    b) preparing a pesticidal composition comprising the pesticidal agent identified in step a).

14. A method for identifying the mode of action of a probe compound comprising:
    i) treating a plant with one or more radiolabeled pyrimidine biosynthesis intermediates in the presence of probe compound,
    ii) treating a plant with one or more radiolabeled pyrimidine biosynthesis intermediates in the absence of probe compound,
    iii) determining the percent conversion of said radiolabeled pyrimidine biosynthesis intermediates to radiolabeled pyrimidine biosynthesis products

selected from the group consisting of: orotate, uridine-5'-monophosphate, and uracil,

iv) comparing the percent conversion of said intermediates to said products of "ii" with those from step "iii", and

v) noting specific accumulations of said products in the presence of probe compound as compared to the absence of probe compound.

15. The method according to claim 14, wherein the plant is a member selected for the group consisting of: seeds, seedlings, germinated seeds, emerging seedlings, plant tissue, meristematic tissue, root tissue, stem tissue, flower tissue, cotyledon tissue, shoot tissue, callus, plant cultures, plant cells, plant vegetation, plant roots, Arabidopsis plants, and Arabidopsis seeds.

16. The method according to claim 15, wherein the radiolabeled pyrimidine biosynthesis intermediates are selected from the group consisting of: [14C] carbamoyl aspartate, [14C] dihydroorotate, [14C] orotate, [14C]-orotidine-5'-monophosphate, [14C]-uridine-5'-monophosphate, [14C]-uridine-5'-diphosphate, [14C]-uridine-5'-triphosphate.